UNH-IOL
DSL Consortium
On-line Reconfiguration Interoperability Test Suite (OLR) Report Revision 1.0

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14 August 2006

Mr. Mike Vendor
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Mr. Vendor,

Enclosed are the On-line Reconfiguration Test Suite results for the DSL Consortium Model A CPE and DSL Consortium Model AB DSLAM. The testing was performed according to Version 2.0.0 of the On-line Reconfiguration Interoperability Test Suite, which may be downloaded from the following address:

ftp://ftp.iol.unh.edu/pub/dsl/testsuites/OLRv200_test_suite.pdf

If you have any questions about the test procedures or results, please contact me via email at joe@iol.unh.edu, or by phone at +1-603-862-2911.

Sincerely,

Joe Tester

Digitally signed by UNH-IOL
Date: 2006.08.14 15:45:12 -04'00'

Joe Tester

Report reviewed by

Jane Tester

Jane Tester

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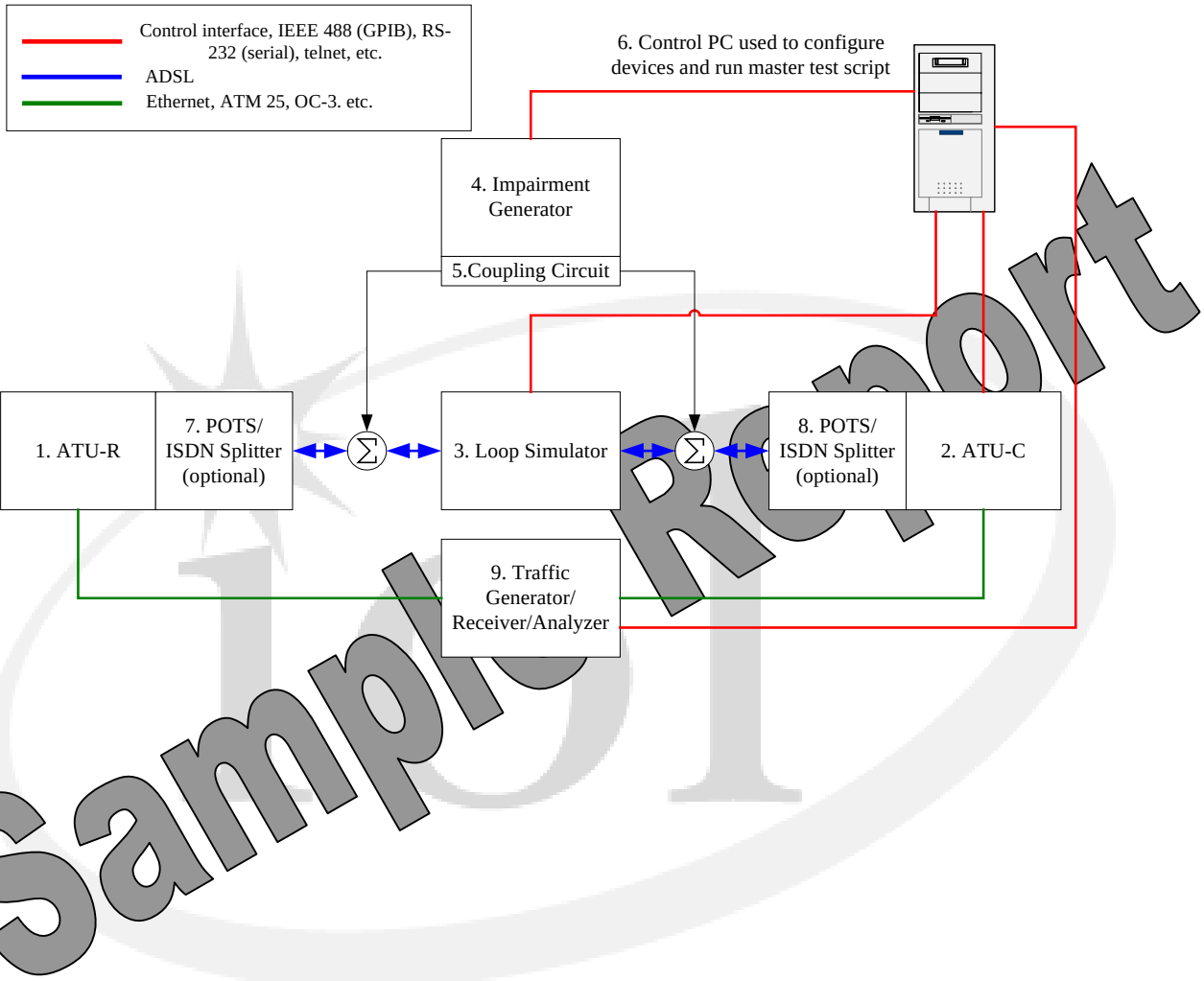
Test Summary

Test Number	Test Name	Results Table
Group 1 – ADSL2 Seamless Rate Adaptation Tests		
OLR.1.1	SRA Functionality in the Presence of Increasing Noise – Loop Length: 1000 ft	**OLR.1.1.1**
OLR.1.1	SRA Functionality in the Presence of Increasing Noise – Loop Length: 3000 ft	**OLR.1.1.2**
OLR.1.1	SRA Functionality in the Presence of Increasing Noise – Loop Length: 6000 ft	**OLR.1.1.3**
OLR.1.1	SRA Functionality in the Presence of Increasing Noise – Loop Length: 9000 ft	**OLR.1.1.4**
OLR.1.1	SRA Functionality in the Presence of Increasing Noise – Loop Length: 12000 ft	**OLR.1.1.5**
OLR.1.2	SRA Functionality in the Presence of Decreasing Noise – Loop Length: 1000 ft	**OLR.1.2.1**
OLR.1.2	SRA Functionality in the Presence of Decreasing Noise – Loop Length: 3000 ft	**OLR.1.2.2**
OLR.1.2	SRA Functionality in the Presence of Decreasing Noise – Loop Length: 6000 ft	**OLR.1.2.3**
OLR.1.2	SRA Functionality in the Presence of Decreasing Noise – Loop Length: 9000 ft	**OLR.1.2.4**
OLR.1.2	SRA Functionality in the Presence of Decreasing Noise – Loop Length: 12000 ft	**OLR.1.2.5**
Group 2 – ADSL Bit Swap Tests		
OLR.2.1	Bit Swap Functionality Test – 51.75 kHz (Bin 12)	**OLR.2.1.1**
OLR.2.1	Bit Swap Functionality Test – 86.25 kHz (Bin 20)	**OLR.2.1.2**
OLR.2.1	Bit Swap Functionality Test – 103.5 kHz (Bin 24)	**OLR.2.1.3**
OLR.2.1	Bit Swap Functionality Test – 345 kHz (Bin 80)	**OLR.2.1.4**
OLR.2.1	Bit Swap Functionality Test – 690 kHz (Bin 160)	**OLR.2.1.5**
OLR.2.1	Bit Swap Functionality Test – 966 kHz (Bin 224)	**OLR.2.1.6**
OLR.2.2	Bit Swap Stress Test – 51.75 kHz (Bin 12)	**OLR.2.2.1**
OLR.2.2	Bit Swap Stress Test – 86.25 kHz (Bin 20)	**OLR.2.2.2**
OLR.2.2	Bit Swap Stress Test – 103.5 kHz (Bin 24)	**OLR.2.1.3**
OLR.2.2	Bit Swap Stress Test – 345 kHz (Bin 80)	**OLR.2.1.4**
OLR.2.2	Bit Swap Stress Test – 690 kHz (Bin 160)	**OLR.2.1.5**
OLR.2.2	Bit Swap Stress Test – 966 kHz (Bin 224)	**OLR.2.1.6**

Test Setups

Test Setup 1: Basic Test Setup



Equipment List

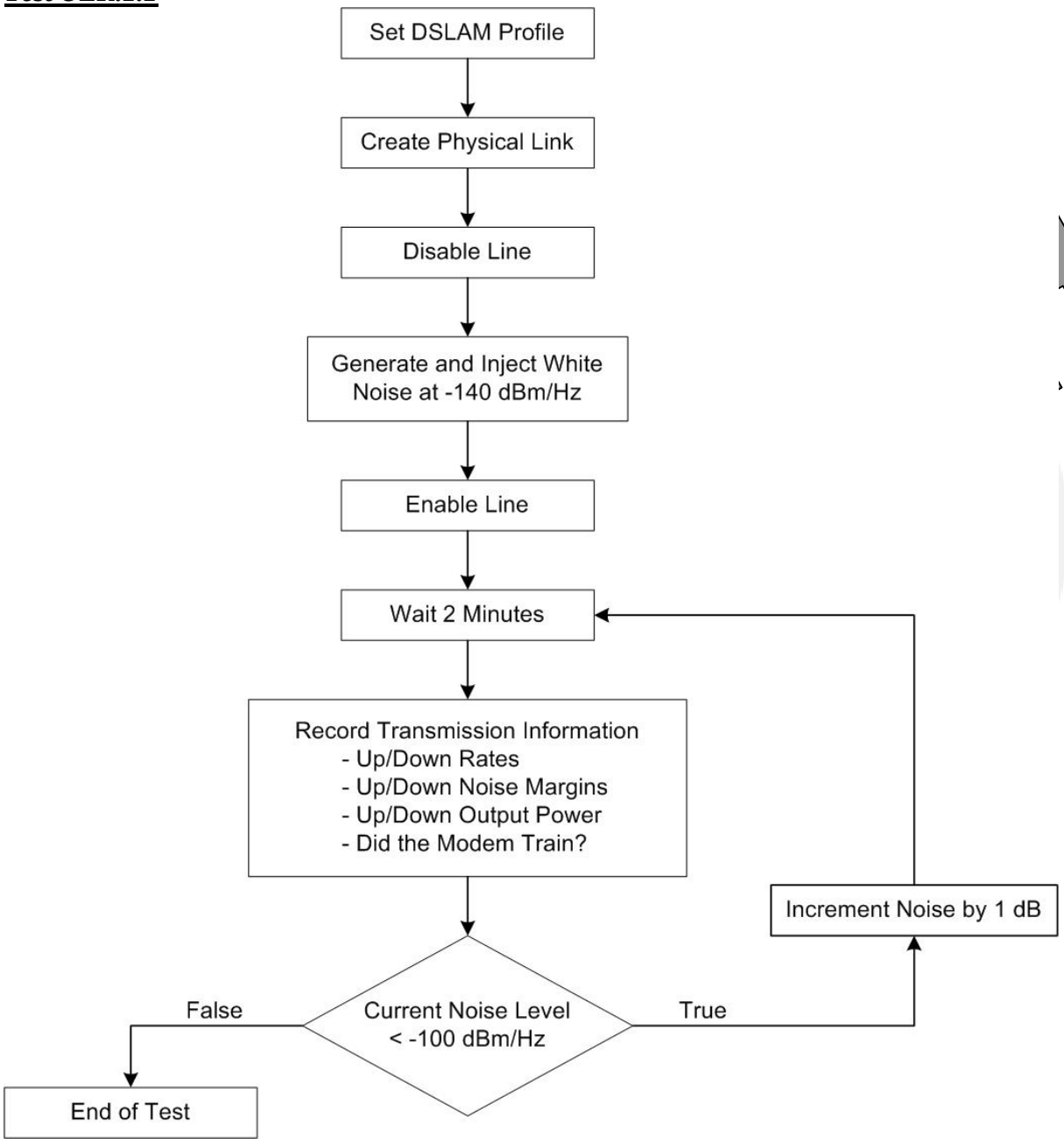
1. DSL Consortium Model A (IOL ID: 9999).
   - Chipset Make: DSL Consortium.
   - Chipset Model: DC1.
   - Chipset Firmware Version: 1.2.3.
   - The Model A was set to train in multimode.
2. DSL Consortium Model AB DSLAM.
   - Line-card: Model BC; port 1 (IOL ID: 9998).
   - Chipset Make: DSL.
   - Chipset Model: 2.0.
   - Chipset Firmware Version: 2.2.
   - System Software Version: 1.2.23.
   - Profile parameters used for each section of this test are displayed in appendix A of this document.
   - Net data rates were taken from the ATU-C configuration interface.
3. Loop simulator: DSL Line Simulator.
   - Loop simulator serial #: 99999
   - Compensated loops were not applied in this test setup.
4. Impairment generator: Company C Noise Generator.
   - DSL noise file package version 1.0.
     - White_noise.nse
   - Compensated noise levels were not applied in this test setup.
5. Coupling Circuit: Company C coupling circuit.
6. Testing station 1 with LASI (Lasi Automation with Standard Interfaces) version 2005.08.11.
7. Splitter Information: No CPE splitter installed.
8. Splitter Information: No CO splitter installed.
9. Network Traffic Generator/Receiver/Analyzer: Company X (IOL ID: 1231).
   - Interface 1 make/model: Company X/ATM card (based on link partner WAN type).
   - Interface 2 make/model: Company X/Ethernet card.
   - Control software version: 7.8.9.

Terminology and Abbreviations

Term	Description
ACTATPds	Downstream Actual Aggregate Transmit Power
ACTATPus	Upstream Actual Aggregate Transmit Power
ACTDRds	Downstream Actual Data Rate
ACTDRus	Upstream Actual Data Rate
Mode	Mode = ANSI (ANSI T1.413-1998), DMT (ITU-T G.992.1 Annex A/B), LITE (ITU-T G.992.2), A2 (ITU-T G.992.3 Annex A/B), A2 L (ITU-T G.992.3 Annex L) or A2+ (ITU-T G.992.5).
NC	No Connection
SNRMds	Downstream Signal to Noise Ratio Margin
SNRMus	Upstream Signal to Noise Ratio Margin
Link State	Indicates the link state of the DSL system since the previous collection of transmission information. INIT = the system initialized, RE-INIT = the system reinitialized, IS = the system remained in service for the duration of time.

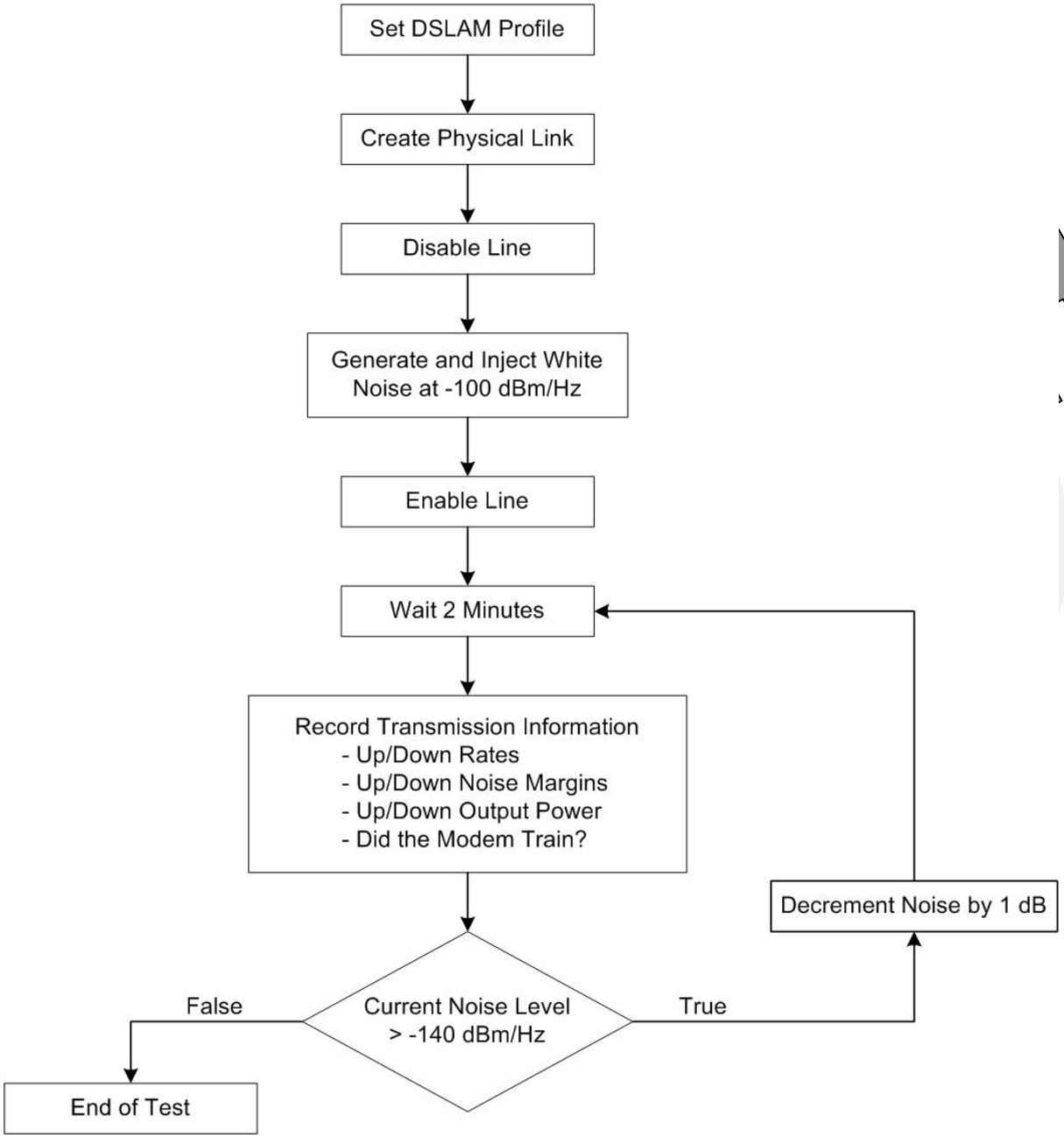
Graphical Representation of the Test Procedure

Test OLR.1.1



Notes:
1. The default time period of 2 minutes between noise increments was used.
2. The default noise level increment of 1 dB was used.

Test OLR.1.2



Notes:
1. The default time period of 2 minutes between noise increments was used.
2. The default noise level decrement of 1 dB was used.

Test Detail

Group 1: ADSL2 Seamless Rate Adaptation Tests

Test OLR.1.1.1, White Noise Level –140 dBm/Hz to –100 dBm/Hz, Loop Length: 1000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-140	23318	1311	11.8	10.1	11.1	12.3	A2+	INIT
-139	23318	1315	11.8	9.9	11.1	12.3	A2+	IS
-138	23318	1315	11.8	10	11.1	12.3	A2+	IS
-137	23318	1315	11.8	9.9	11.1	12.3	A2+	IS
-136	23318	1315	11.8	9.9	11.1	12.3	A2+	IS
-135	23318	1315	11.7	10	11.1	12.3	A2+	IS
-134	23318	1315	11.7	9.9	11.1	12.3	A2+	IS
-133	23318	1315	11.7	9.9	11.1	12.3	A2+	IS
-132	23318	1315	11.7	9.8	11.1	12.3	A2+	IS
-131	23318	1315	11.6	9.9	11.1	12.3	A2+	IS
-130	23318	1315	11.6	9.8	11.1	12.3	A2+	IS
-129	23318	1315	11.5	9.9	11.1	12.3	A2+	IS
-128	23318	1315	11.5	9.9	11.1	12.3	A2+	IS
-127	23318	1315	11.4	10	11.1	12.3	A2+	IS
-126	23318	1315	11.2	10	11.1	12.3	A2+	IS
-125	23318	1315	11.1	9.9	11.1	12.3	A2+	IS
-124	23318	1315	11	9.9	11.1	12.3	A2+	IS
-123	23318	1315	10.8	9.8	11.1	12.3	A2+	IS
-122	23318	1315	10.6	9.9	11.1	12.3	A2+	IS
-121	23318	1315	10.3	9.8	11.1	12.3	A2+	IS
-120	23318	1315	10	9.9	11.1	12.3	A2+	IS
-119	23318	1315	9.6	9.9	11.1	12.3	A2+	IS
-118	23318	1315	9.8	9.7	12.2	12.3	A2+	IS
-117	23318	1315	9.4	9.8	12.2	12.3	A2+	IS
-116	23318	1315	8.9	9.8	12.2	12.3	A2+	IS
-115	23318	1315	8.4	9.7	12.2	12.3	A2+	IS
-114	23318	1315	8	9.6	12.5	12.3	A2+	IS
-113	23318	1315	7.4	9.5	12.5	12.3	A2+	IS
-112	23318	1315	6.8	9.4	12.5	12.3	A2+	IS
-111	23318	1315	6	9.3	12.5	12.3	A2+	IS
-110	23318	1315	5.3	9.1	12.5	12.3	A2+	IS
-109	23318	1315	4.5	8.9	12.5	12.3	A2+	IS
-108	23318	1315	3.7	8.7	12.5	12.3	A2+	IS
-107	23318	1315	2.8	8.3	12.5	12.3	A2+	IS
-106	20539	1296	7.9	8.4	13.5	12.1	A2+	RE-INIT
-105	20539	1296	7	8	13.5	12.1	A2+	IS
-104	20539	1296	6.1	7.6	13.5	12.1	A2+	IS
-103	20539	1296	5.1	7.2	13.5	12.1	A2+	IS
-102	20539	1296	4.2	6.6	13.5	12.1	A2+	IS
-101	20539	1296	3.3	6.1	13.5	12.1	A2+	IS
-100	20539	1219	2.3	7.6	13.5	11.1	A2+	IS

Test OLR.1.1.2, White Noise Level –140 dBm/Hz to –100 dBm/Hz, Loop Length: 3000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-140	23318	1303	9.1	8.7	16.7	12.3	A2+	INIT
-139	23318	1303	9.1	10.1	16.7	12.3	A2+	IS
-138	23318	1303	9	10.3	16.7	12.3	A2+	IS
-137	23318	1307	8.9	10.1	16.7	12.3	A2+	IS
-136	23318	1303	8.7	10.4	16.7	12.3	A2+	IS
-135	23318	1307	8.6	10.1	16.7	12.3	A2+	IS
-134	23318	1307	8.4	10	16.7	12.3	A2+	IS
-133	23318	1307	8.2	10	16.7	12.3	A2+	IS
-132	23318	1307	8.1	10	17.1	12.3	A2+	IS
-131	23318	1307	7.8	10	17.1	12.3	A2+	IS
-130	23318	1307	7.5	9.9	17.1	12.3	A2+	IS
-129	23318	1307	7.1	9.9	17.1	12.3	A2+	IS
-128	23318	1307	6.7	10	17.1	12.3	A2+	IS
-127	23318	1307	6.3	10	17.1	12.3	A2+	IS
-126	23318	1307	5.8	10	17.1	12.3	A2+	IS
-125	23318	1307	5.2	10	17.1	12.3	A2+	IS
-124	23318	1307	4.6	9.9	17.1	12.3	A2+	IS
-123	23318	1307	4	10	17.1	12.3	A2+	IS
-122	23318	1307	3.4	9.9	17.1	12.3	A2+	IS
-121	23318	1307	2.7	9.8	17.1	12.3	A2+	IS
-120	20379	1303	7.9	10.1	18.3	12.3	A2+	RE-INIT
-119	20379	1311	7.2	9.9	18.3	12.3	A2+	IS
-118	20379	1311	6.4	9.9	18.3	12.3	A2+	IS
-117	20379	1311	5.6	9.8	18.3	12.3	A2+	IS
-116	20379	1311	4.7	9.8	18.3	12.3	A2+	IS
-115	20379	1311	3.9	9.5	18.3	12.3	A2+	IS
-114	20379	1311	3	9.5	18.3	12.3	A2+	IS
-113	20379	1311	2.1	9.3	18.3	12.3	A2+	IS
-112	16423	1299	7.9	9.5	18.2	12.1	A2+	RE-INIT
-111	16423	1299	7	9.1	18.2	12.1	A2+	IS
-110	16423	1299	6.1	8.9	18.2	12.1	A2+	IS
-109	16423	1299	5.1	8.8	18.2	12.1	A2+	IS
-108	16423	1299	4.2	8.4	18.2	12.1	A2+	IS
-107	16423	1299	3.3	8	18.2	12.1	A2+	IS
-106	16423	1299	2.3	7.6	18.2	12.1	A2+	IS
-105	12500	1265	8	8.4	18.3	12.1	A2+	RE-INIT
-104	12500	1265	7.1	8	18.3	12.3	A2+	IS
-103	12500	1265	6.1	7.4	18.3	12.3	A2+	IS
-102	12500	1265	5.1	6.8	18.3	12.3	A2+	IS
-101	12500	1265	4.1	6.2	18.3	12.3	A2+	IS
-100	12500	1219	3.2	6.7	18.3	12.1	A2+	IS

Test OLR.1.1.3, White Noise Level –140 dBm/Hz to –100 dBm/Hz, Loop Length: 6000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-140	15870	1296	8.2	9.3	18.3	12.3	A2+	INIT
-139	15870	1296	7.6	9.5	18.3	12.3	A2+	IS
-138	15870	1296	7.1	9.4	18.3	12.3	A2+	IS
-137	15870	1296	6.5	9.5	18.3	12.3	A2+	IS
-136	15870	1296	5.9	9.5	18.3	12.3	A2+	IS
-135	15870	1296	5.3	9.4	18.3	12.3	A2+	IS
-134	15870	1296	4.7	9.4	18.3	12.3	A2+	IS
-133	15870	1296	4	9.4	18.3	12.3	A2+	IS
-132	15870	1296	3.3	9.4	18.3	12.3	A2+	IS
-131	15870	1296	2.6	9.4	18.3	12.3	A2+	IS
-130	12949	1292	8	9.3	18.3	12.1	A2+	RE-INIT
-129	12949	1292	7.3	9.3	18.3	12.1	A2+	IS
-128	12949	1292	6.5	9.2	18.3	12.1	A2+	IS
-127	12949	1292	5.7	9.2	18.3	12.1	A2+	IS
-126	12949	1292	4.8	9.2	18.3	12.1	A2+	IS
-125	12949	1292	3.9	8.9	18.3	12.1	A2+	IS
-124	12949	1292	3	8.9	18.3	12.1	A2+	IS
-123	12949	1292	2.1	8.7	18.3	12.1	A2+	IS
-122	9973	1280	8	9	18.4	12.1	A2+	RE-INIT
-121	9973	1280	7.1	8.7	18.4	12.1	A2+	IS
-120	9973	1280	6.2	8.5	18.4	12.1	A2+	IS
-119	9973	1280	5.2	8.1	18.4	12.1	A2+	IS
-118	9973	1280	4.3	7.8	18.4	12.1	A2+	IS
-117	9973	1280	3.3	7.4	18.4	12.1	A2+	IS
-116	9973	1280	2.4	6.9	18.4	12.1	A2+	IS
-115	7419	1226	8	8.1	18.5	11.9	A2+	RE-INIT
-114	7419	1226	7.2	7.6	18.5	11.9	A2+	IS
-113	7419	1226	6.2	7	18.5	11.9	A2+	IS
-112	7419	1226	5.3	6.4	18.5	11.9	A2+	IS
-111	7419	1164	4.3	7.9	18.5	12.2	A2+	IS
-110	7419	1164	3.3	7.1	18.5	12.2	A2+	IS
-109	7419	1164	2.4	6.4	18.5	12.2	A2+	IS
-108	5240	1085	8	7.9	18.7	12.1	A2+	RE-INIT
-107	5240	1085	7.1	7.3	18.7	12.1	A2+	IS
-106	5240	1085	6.1	6.5	18.7	12.1	A2+	IS
-105	5240	1013	5.1	8.1	18.7	12.2	A2+	IS
-104	5240	1013	4.2	7.2	18.7	12.2	A2+	IS
-103	5240	1013	3.2	6.3	18.7	12.2	A2+	IS
-102	5240	952	2.2	7.4	18.7	12.2	A2+	IS
-101	3419	890	8.1	8.2	18.9	12.1	A2+	RE-INIT
-100	3419	890	7.1	7.2	18.9	12.1	A2+	IS

Test OLR.1.1.4, White Noise Level –140 dBm/Hz to –100 dBm/Hz, Loop Length: 9000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-140	8807	1206	8	7.8	18.6	12.1	A2+	INIT
-139	8807	1206	7.2	7.8	18.6	12.1	A2+	IS
-138	8807	1206	6.5	7.8	18.6	12.1	A2+	IS
-137	8807	1206	5.6	7.8	18.6	12.1	A2+	IS
-136	8807	1206	4.8	7.7	18.6	12.1	A2+	IS
-135	8807	1206	3.9	7.7	18.6	12.1	A2+	IS
-134	8807	1206	3.1	7.7	18.6	12.1	A2+	IS
-133	8807	1206	2.2	7.6	18.6	12.1	A2+	IS
-132	6837	1195	8	7.8	18.8	11.8	A2+	RE-INIT
-131	6837	1195	7.1	7.8	18.8	11.8	A2+	IS
-130	6837	1195	6.2	7.7	18.8	11.8	A2+	IS
-129	6837	1195	5.3	7.6	18.8	11.8	A2+	IS
-128	6837	1195	4.4	7.4	18.8	11.8	A2+	IS
-127	6837	1195	3.4	7.3	18.8	11.8	A2+	IS
-126	6837	1195	2.5	7	18.8	11.8	A2+	IS
-125	NT	NT	NT	NT	NT	NT	NT	NT
-124	5040	1153	7.1	7.9	18.9	12.2	A2+	RE-INIT
-123	5040	1153	6.1	7.7	18.9	12.3	A2+	IS
-122	5040	1153	5.2	7.3	18.9	12.3	A2+	IS
-121	5040	1153	4.2	6.8	18.9	12.3	A2+	IS
-120	5040	1153	3.3	6.4	18.9	12.3	A2+	IS
-119	5040	1099	2.3	7.4	18.9	12.1	A2+	IS
-118	3568	1054	8	8.1	18.9	12.2	A2+	RE-INIT
-117	3568	1054	7.1	7.6	18.9	12.2	A2+	IS
-116	3568	1054	6.1	6.9	18.9	12.3	A2+	IS
-115	3568	1054	5.2	6.3	18.9	12.3	A2+	IS
-114	3568	975	4.2	8	18.9	12.2	A2+	IS
-113	3568	975	3.2	7.3	18.9	12.3	A2+	IS
-112	3568	975	2.3	6.5	18.9	12.3	A2+	IS
-111	2345	886	8.1	8	18.9	12.2	A2+	RE-INIT
-110	2345	886	7.1	7.4	18.9	12.3	A2+	IS
-109	2345	886	6.2	6.6	18.9	12.3	A2+	IS
-108	2345	853	5.2	6.6	18.9	12.1	A2+	IS
-107	2345	853	4.2	5.7	18.9	12.1	A2+	IS
-106	2345	853	3.2	4.8	18.9	12.1	A2+	IS
-105	2345	853	2.2	3.8	18.9	12.1	A2+	IS
-104	1401	526	8	8.5	18.3	12.2	A2 L	RE-INIT
-103	1401	526	7.1	7.7	18.3	12.2	A2 L	IS
-102	1401	526	6.1	6.7	18.3	12.2	A2 L	IS
-101	1401	504	5.2	6.7	18.3	12.1	A2 L	IS
-100	1401	504	4.2	5.7	18.3	12.1	A2 L	IS

Test OLR.1.1.5, White Noise Level –140 dBm/Hz to –100 dBm/Hz, Loop Length: 12000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-140	4316	936	8.1	8.1	18.9	12.2	A2+	INIT
-139	4316	936	7.4	8.1	18.9	12.3	A2+	IS
-138	4316	936	6.6	8.2	18.9	12.3	A2+	IS
-137	4316	936	5.8	7.9	18.9	12.3	A2+	IS
-136	4316	936	5	8	18.9	12.3	A2+	IS
-135	4316	936	4.1	8	18.9	12.3	A2+	IS
-134	4316	936	3.3	7.9	18.9	12.3	A2+	IS
-133	4316	936	2.5	7.8	18.9	12.3	A2+	IS
-132	3227	913	8.1	8	18.9	12.1	A2+	RE-INIT
-131	3227	913	7.2	8	18.9	12.1	A2+	IS
-130	3227	913	6.3	7.9	18.9	12.3	A2+	IS
-129	3227	913	5.4	7.8	18.9	12.3	A2+	IS
-128	3227	913	4.4	7.7	18.9	12.3	A2+	IS
-127	3227	913	3.5	7.5	18.9	12.3	A2+	IS
-126	3227	913	2.6	7.2	18.9	12.3	A2+	IS
-125	2163	875	8.1	8.1	18.2	12.2	A2+	RE_INIT
-124	2163	875	7.2	7.9	18.2	12.3	A2+	IS
-123	2163	875	6.2	7.6	18.2	12.3	A2+	IS
-122	2163	875	5.3	7.2	18.2	12.3	A2+	IS
-121	2163	875	4.3	6.7	18.2	12.3	A2+	IS
-120	2163	875	3.4	6.2	18.2	12.3	A2+	IS
-119	2163	852	2.4	6.1	18.2	12.2	A2+	IS
-118	1397	568	8	8	18.2	12.1	A2 L	RE_INIT
-117	1397	568	7.2	8.1	18.2	12.2	A2 L	IS
-116	1397	568	6.2	7.4	18.2	12.2	A2 L	IS
-115	1397	568	5.3	6.8	18.2	12.2	A2 L	IS
-114	1397	568	4.3	6.2	18.2	12.2	A2 L	IS
-113	1397	553	3.4	6.1	18.2	12.2	A2 L	IS
-112	1397	553	2.4	5.2	18.2	12.2	A2 L	IS
-111	793	470	8.1	8	18.3	12.2	A2 L	RE_INIT
-110	793	470	7.2	7.5	18.3	12.3	A2 L	IS
-109	793	470	6.2	6.7	18.3	12.3	A2 L	IS
-108	793	452	5.3	6.6	18.3	12.2	A2 L	IS
-107	793	452	4.3	5.7	18.3	12.2	A2 L	IS
-106	793	452	3.3	4.7	18.3	12.2	A2 L	IS
-105	793	452	2.4	3.7	18.3	12.2	A2 L	IS
-104	438	343	8.2	8	17.7	12.1	A2 L	RE_INIT
-103	438	343	7.3	7.2	17.7	12.1	A2 L	IS
-102	438	343	6.4	6.2	17.7	12.1	A2 L	IS
-101	438	336	5.4	5.5	17.7	12.2	A2 L	IS
-100	438	336	4.5	4.5	17.7	12.2	A2 L	IS

Test OLR.1.2.1, White Noise Level –100 dBm/Hz to –140 dBm/Hz, Loop Length: 1000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-100	17253	1218	8	8.2	13.5	12.2	A2+	INIT
-101	17253	1218	8.9	8.8	13.5	12.3	A2+	IS
-102	17253	1218	9.9	9.4	13.5	12.3	A2+	IS
-103	17253	1218	10.8	10	13.5	12.3	A2+	IS
-104	17253	1291	11.7	7.9	13.5	12.1	A2+	IS
-105	17253	1291	12.6	8.3	13.5	12.1	A2+	IS
-106	17253	1291	13.5	8.6	13.5	12.1	A2+	IS
-107	17253	1291	14.4	8.9	13.5	12.1	A2+	IS
-108	17253	1291	15.2	9.3	13.5	12.1	A2+	IS
-109	17253	1291	16	9.6	13.5	12.3	A2+	IS
-110	17253	1291	16.7	9.7	13.5	12.3	A2+	IS
-111	17253	1291	17.5	9.9	13.5	12.3	A2+	IS
-112	17253	1302	18.2	9.7	13.5	12.3	A2+	IS
-113	17253	1302	18.8	9.7	13.5	12.3	A2+	IS
-114	17253	1302	19.4	9.8	13.5	12.3	A2+	IS
-115	17253	1302	20	10	13.5	12.3	A2+	IS
-116	17253	1302	20.5	10.1	13.5	12.3	A2+	IS
-117	17253	1302	21	10	13.5	12.3	A2+	IS
-118	17253	1306	21.4	10	13.5	12.3	A2+	IS
-119	17253	1306	21.7	10	13.5	12.3	A2+	IS
-120	17253	1306	22.1	10	13.5	12.3	A2+	IS
-121	17253	1306	22.4	10	13.5	12.3	A2+	IS
-122	17253	1306	22.6	10	13.5	12.3	A2+	IS
-123	17253	1306	22.8	10	13.5	12.3	A2+	IS
-124	17253	1306	22.9	10	13.5	12.3	A2+	IS
-125	17253	1306	23.1	10.1	13.5	12.3	A2+	IS
-126	17253	1306	23.2	10.1	13.5	12.3	A2+	IS
-127	17253	1302	23.2	10.3	13.5	12.3	A2+	IS
-128	17253	1306	23.3	10	13.5	12.3	A2+	IS
-129	17253	1306	23.4	10	13.5	12.3	A2+	IS
-130	17253	1306	23.4	9.9	13.5	12.3	A2+	IS
-131	17253	1306	23.5	9.8	13.5	12.3	A2+	IS
-132	17253	1306	23.4	10	13.5	12.3	A2+	IS
-133	17253	1306	23.5	9.9	13.5	12.3	A2+	IS
-134	17253	1306	23.5	10	13.5	12.3	A2+	IS
-135	17253	1306	23.6	9.8	13.5	12.3	A2+	IS
-136	17253	1306	23.5	10	13.5	12.3	A2+	IS
-137	17253	1306	23.6	10	13.5	12.3	A2+	IS
-138	17253	1306	23.6	10	13.5	12.3	A2+	IS
-139	17253	1306	23.6	9.9	13.5	12.3	A2+	IS
-140	17253	1306	23.6	10	13.5	12.3	A2+	IS

Test OLR.1.2.2, White Noise Level –100 dBm/Hz to –140 dBm/Hz, Loop Length: 3000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-100	9910	1172	8	8.3	18.3	12.2	A2+	INIT
-101	9910	1172	9	9	18.3	12.2	A2+	IS
-102	9910	1172	10	9.7	18.3	12.2	A2+	IS
-103	9910	1245	11	7.9	18.3	12.1	A2+	IS
-104	9910	1245	12	8.5	18.3	12.1	A2+	IS
-105	9910	1245	12.9	9	18.3	12.1	A2+	IS
-106	9910	1245	13.9	9.6	18.3	12.1	A2+	IS
-107	9910	1245	14.9	9.9	18.3	12.1	A2+	IS
-108	9910	1306	15.8	8.1	18.3	12.1	A2+	IS
-109	9910	1306	16.8	8.4	18.3	12.1	A2+	IS
-110	9910	1306	17.7	8.7	18.3	12.3	A2+	IS
-111	9910	1306	18.6	9	18.3	12.3	A2+	IS
-112	9910	1306	19.5	9.2	18.3	12.2	A2+	IS
-113	9910	1306	20.3	9.4	18.3	12.3	A2+	IS
-114	9910	1306	21.2	9.5	18.3	12.3	A2+	IS
-115	9910	1306	22	9.6	18.3	12.3	A2+	IS
-116	9910	1306	22.8	9.7	18.3	12.3	A2+	IS
-117	9910	1306	23.6	9.7	18.3	12.2	A2+	IS
-118	9910	1306	24.3	10	18.3	12.3	A2+	IS
-119	9910	1306	25.1	10	18.3	12.2	A2+	IS
-120	9910	1306	25.7	10	18.3	12.3	A2+	IS
-121	9910	1306	26.4	10	18.3	12.2	A2+	IS
-122	9910	1306	27	10	18.3	12.3	A2+	IS
-123	9910	1306	27.5	10	18.3	12.3	A2+	IS
-124	9910	1306	28	10	18.3	12.3	A2+	IS
-125	9910	1306	28.4	9.9	18.3	12.3	A2+	IS
-126	9910	1306	28.9	10	18.3	12.3	A2+	IS
-127	9910	1306	29.2	10	18.3	12.3	A2+	IS
-128	9910	1306	29.5	10	18.3	12.3	A2+	IS
-129	9910	1306	29.9	10	18.3	12.3	A2+	IS
-130	9910	1306	30.1	10	18.3	12.3	A2+	IS
-131	9910	1306	30.3	10.1	18.3	12.3	A2+	IS
-132	9910	1306	30.5	9.9	18.3	12.3	A2+	IS
-133	9910	1306	30.6	9.9	18.3	12.3	A2+	IS
-134	9910	1306	30.8	10	18.3	12.3	A2+	IS
-135	9910	1306	30.9	10.1	18.3	12.3	A2+	IS
-136	9910	1306	30.9	9.9	18.3	12.3	A2+	IS
-137	9910	1306	31.1	10.1	18.3	12.3	A2+	IS
-138	9910	1306	31.1	10.1	18.3	12.3	A2+	IS
-139	9910	1306	31.2	10.1	18.3	12.3	A2+	IS
-140	9910	1306	31.2	9.9	18.3	12.3	A2+	IS

Test OLR.1.2.3, White Noise Level –100 dBm/Hz to –140 dBm/Hz, Loop Length: 6000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-100	3163	862	8.1	8.2	18.9	12.3	A2+	INIT
-101	3163	862	9.1	9.1	18.9	12.3	A2+	IS
-102	3163	862	10.1	10	18.9	12.3	A2+	IS
-103	3163	952	11.1	8	18.9	12.2	A2+	IS
-104	3163	952	12.1	8.8	18.9	12.2	A2+	IS
-105	3163	952	13.1	9.8	18.9	12.3	A2+	IS
-106	3163	1035	14.1	7.7	18.9	12.1	A2+	IS
-107	3163	1035	15.1	8.7	18.9	12.1	A2+	IS
-108	3163	1035	16	9.4	18.9	12.1	A2+	IS
-109	3163	1106	17	8	18.9	12.2	A2+	IS
-110	3163	1106	17.9	8.7	18.9	12.2	A2+	IS
-111	3163	1106	18.9	9.3	18.9	12.3	A2+	IS
-112	3163	1106	19.8	10	18.9	12.3	A2+	IS
-113	3163	1189	20.7	7.6	18.9	12	A2+	IS
-114	3163	1189	21.7	8.2	18.9	12	A2+	IS
-115	3163	1189	22.5	8.7	18.9	12	A2+	IS
-116	3163	1189	23.4	9.1	18.9	12	A2+	IS
-117	3163	1189	24.3	9.8	18.9	12.3	A2+	IS
-118	3163	1252	25.1	7.9	18.9	12.1	A2+	IS
-119	3163	1252	25.9	8.3	18.9	12.1	A2+	IS
-120	3163	1252	26.7	8.6	18.9	12.1	A2+	IS
-121	3163	1252	27.4	8.8	18.9	12.1	A2+	IS
-122	3163	1252	28.1	8.9	18.9	12.1	A2+	IS
-123	3163	1252	28.8	9.2	18.9	12.1	A2+	IS
-124	3163	1252	29.3	9.3	18.9	12.1	A2+	IS
-125	3163	1252	29.9	9.4	18.9	12.1	A2+	IS
-126	3163	1252	30.4	9.5	18.9	12.1	A2+	IS
-127	3163	1252	30.9	9.5	18.9	12.1	A2+	IS
-128	3163	1252	31.3	9.6	18.9	12.1	A2+	IS
-129	3163	1252	31.7	9.7	18.9	12.3	A2+	IS
-130	3163	1252	32.1	9.6	18.9	12.3	A2+	IS
-131	3163	1252	32.4	9.6	18.9	12.3	A2+	IS
-132	3163	1252	32.6	9.7	18.9	12.3	A2+	IS
-133	3163	1252	32.8	9.7	18.9	12.3	A2+	IS
-134	3163	1252	33.1	9.7	18.9	12.3	A2+	IS
-135	3163	1252	33.2	9.7	18.9	12.3	A2+	IS
-136	3163	1252	33.4	9.7	18.9	12.3	A2+	IS
-137	3163	1252	33.6	9.8	18.9	12.3	A2+	IS
-138	3163	1252	33.6	9.7	18.9	12.3	A2+	IS
-139	3163	1252	33.7	9.8	18.9	12.3	A2+	IS
-140	3163	1252	33.8	9.7	18.9	12.3	A2+	IS

Test OLR.1.2.4, White Noise Level –100 dBm/Hz to –140 dBm/Hz, Loop Length: 9000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-100	991	452	8.1	8.2	18.5	12.3	A2 L	Yes
-101	991	452	9.1	9.1	18.5	12.2	A2 L	IS
-102	991	496	10.1	8	18.5	12.2	A2 L	IS
-103	991	496	11.1	8.9	18.5	12.2	A2 L	IS
-104	991	496	12.1	9.7	18.5	12.2	A2 L	IS
-105	991	552	13.1	8	18.5	12.2	A2 L	IS
-106	991	552	14.1	8.8	18.5	12.2	A2 L	IS
-107	991	552	15	9.7	18.5	12.2	A2 L	IS
-108	991	563	16	10	18.5	12.2	A2 L	IS
-109	991	563	17	10.9	18.5	12.2	A2 L	IS
-110	991	563	17.9	11.8	18.5	12.2	A2 L	IS
-111	991	563	18.8	12.4	18.5	12.2	A2 L	IS
-112	991	563	19.8	13.1	18.5	12.2	A2 L	IS
-113	991	563	20.7	13.7	18.5	12.2	A2 L	IS
-114	991	563	21.6	14.3	18.5	12.2	A2 L	IS
-115	991	563	22.5	14.7	18.5	12.2	A2 L	IS
-116	991	563	23.3	15.1	18.5	12.2	A2 L	IS
-117	991	563	24.1	15.6	18.5	12.2	A2 L	IS
-118	991	563	25	16	18.5	12.2	A2 L	IS
-119	991	563	25.7	16.2	18.5	12.2	A2 L	IS
-120	991	563	26.5	16.5	18.5	12.2	A2 L	IS
-121	991	563	27.2	16.8	18.5	12.2	A2 L	IS
-122	991	563	27.8	17	18.5	12.2	A2 L	IS
-123	991	563	28.5	17	18.5	12.2	A2 L	IS
-124	991	563	29	17.2	18.5	12.2	A2 L	IS
-125	991	563	29.5	17.3	18.5	12.2	A2 L	IS
-126	991	563	30	17.5	18.5	12.2	A2 L	IS
-127	991	563	30.4	17.5	18.5	12.2	A2 L	IS
-128	991	563	30.7	17.6	18.5	12.2	A2 L	IS
-129	991	563	31.2	17.7	18.5	12.2	A2 L	IS
-130	991	563	31.6	17.8	18.5	12.2	A2 L	IS
-131	991	563	31.7	17.7	18.5	12.2	A2 L	IS
-132	991	563	31.9	17.8	18.5	12.2	A2 L	IS
-133	991	563	32.1	17.8	18.5	12.2	A2 L	IS
-134	991	563	32.2	17.9	18.5	12.2	A2 L	IS
-135	991	563	32.3	17.8	18.5	12.2	A2 L	IS
-136	991	563	32.5	17.9	18.5	12.2	A2 L	IS
-137	991	563	32.6	17.8	18.5	12.2	A2 L	IS
-138	991	563	32.6	17.9	18.5	12.2	A2 L	IS
-139	991	563	32.5	17.9	18.5	12.2	A2 L	IS
-140	991	563	32.8	17.8	18.5	12.2	A2 L	IS

Test OLR.1.2.5, White Noise Level –100 dBm/Hz to –140 dBm/Hz, Loop Length: 12000 ft, Test ID: 5555								
Noise Level (dBm/Hz)	**ACTDRds (kbps)**	**ACTDRus (kbps)**	**SNRMds (dB)**	**SNRMus (dB)**	**ACTATPds (dB)**	**ACTATPus (dB)**	**Mode**	**Link State**
-100	NC	NC	NC	NC	NC	NC	NC	NC
-101	NC	NC	NC	NC	NC	NC	NC	NC
-102	NC	NC	NC	NC	NC	NC	NC	NC
-103	434	321	8.2	8.1	17.4	12.1	A2 L	INIT
-104	434	321	9.3	9.1	17.4	12.1	A2 L	IS
-105	434	364	10.3	8.1	17.4	12.2	A2 L	IS
-106	434	364	11.3	9	17.4	12.2	A2 L	IS
-107	434	364	12.3	10.1	17.4	12.2	A2 L	IS
-108	434	425	13.2	8	17.4	12.2	A2 L	IS
-109	434	425	14.2	8.9	17.4	12.2	A2 L	IS
-110	434	425	15.1	10	17.4	12.2	A2 L	IS
-111	434	485	16.1	8.1	17.4	12.1	A2 L	IS
-112	434	485	17.1	8.9	17.4	12.1	A2 L	IS
-113	434	485	18.1	9.6	17.4	12.1	A2 L	IS
-114	434	532	19	7.9	17.4	12	A2 L	IS
-115	434	532	19.9	8.5	17.4	12	A2 L	IS
-116	434	532	20.8	9.1	17.4	12.1	A2 L	IS
-117	434	532	21.8	9.5	17.4	12.1	A2 L	IS
-118	434	532	22.6	9.8	17.4	12.1	A2 L	IS
-119	434	571	23.6	8	17.4	12.1	A2 L	IS
-120	434	571	24.4	8.2	17.4	12.1	A2 L	IS
-121	434	571	25.3	8.5	17.4	12.1	A2 L	IS
-122	434	571	26.1	8.5	17.4	12.1	A2 L	IS
-123	434	571	26.8	8.7	17.4	12.1	A2 L	IS
-124	434	571	27.6	8.9	17.4	12.2	A2 L	IS
-125	434	571	28.2	9	17.4	12.2	A2 L	IS
-126	434	571	28.8	9.1	17.4	12.2	A2 L	IS
-127	434	571	29.5	9.1	17.4	12.2	A2 L	IS
-128	434	571	30	9.3	17.4	12.2	A2 L	IS
-129	434	571	30.6	9.3	17.4	12.2	A2 L	IS
-130	434	571	31	9.3	17.4	12.2	A2 L	IS
-131	434	571	31.4	9.3	17.4	12.2	A2 L	IS
-132	434	571	31.9	9.3	17.4	12.2	A2 L	IS
-133	434	571	32.3	9.3	17.4	12.3	A2 L	IS
-134	434	571	32.5	9.4	17.4	12.3	A2 L	IS
-135	434	571	32.7	9.4	17.4	12.3	A2 L	IS
-136	434	571	32.9	9.4	17.4	12.3	A2 L	IS
-137	434	571	33.2	9.3	17.4	12.3	A2 L	IS
-138	434	571	33.2	9.4	17.4	12.3	A2 L	IS
-139	434	571	33.4	9.4	17.4	12.3	A2 L	IS
-140	434	571	33.6	9.5	17.4	12.3	A2 L	IS

Group 2: ADSL Bit Swap Tests

Test Number and Label		
OLR.2.1.1: Tone #1, Injected at 51.75 kHz (Bin 12)		
Purpose: The purpose of this test is to observe the basic bit swap functionality of the ATU-R/ATU-C pair by injecting an interfering tone at the system's 12th subcarrier frequency.		
Transmission System Parameters		
Parameter	**Value**	
Modulation	ADSL2	
Upstream Data Rate (kbps)	1205	
Downstream Data Rate (kbps)	11996	
Upstream Attainable Data Rate (kbps)	NA	
Downstream Attainable Data Rate (kbps)	NA	
Upstream SNRM (dB)	6.1	
Downstream SNRM (dB)	10.5	
Upstream Aggregate Transmit Power (dBm)	12.1	
Downstream Aggregate Transmit Power (dBm)	18.6	
Upstream Line Attenuation (dB)	10	
Downstream Line Attenuation (dB)	17	
Upstream Interleave Delay (sec)	11	
Downstream Interleave Delay (sec)	0	
Upstream INP (symbols)	NA	
Downstream INP (symbols)	NA	
Test Results		
Tone Level	**Bits in Bin #12**	**Bits Swapped**
Not Applied	13	-
-75 dBm	13	0
-70 dBm	13	0
-65 dBm	13	0
-60 dBm	13	0
-55 dBm	13	0
-50 dBm	11	-2
-55 dBm	11	0
-60 dBm	12	+1
-65 dBm	12	0
-70 dBm	12	0
-75 dBm	13	+1
Not Applied	13	0
Comments on Test Results		

Test Number and Label		
OLR.2.1.2: Tone #2, Injected at 86.25 kHz (Bin 20)		
Purpose: The purpose of this test is to observe the basic bit swap functionality of the ATU-R/ATU-C pair by injecting an interfering tone at the system's 20th subcarrier frequency.		
Transmission System Parameters		
Parameter	**Value**	
Modulation	ADSL2	
Upstream Data Rate (kbps)	1186	
Downstream Data Rate (kbps)	11996	
Upstream Attainable Data Rate (kbps)	NA	
Downstream Attainable Data Rate (kbps)	NA	
Upstream SNRM (dB)	6	
Downstream SNRM (dB)	11	
Upstream Aggregate Transmit Power (dBm)	12.3	
Downstream Aggregate Transmit Power (dBm)	18.6	
Upstream Line Attenuation (dB)	10	
Downstream Line Attenuation (dB)	17	
Upstream Interleave Delay (sec)	12	
Downstream Interleave Delay (sec)	0	
Upstream INP (symbols)	NA	
Downstream INP (symbols)	NA	
Test Results		
Tone Level	**Bits in Bin #20**	**Bits Swapped**
Not Applied	15	-
-75 dBm	15	0
-70 dBm	15	0
-65 dBm	15	0
-60 dBm	14	-1
-55 dBm	13	-1
-50 dBm	12	-1
-55 dBm	12	0
-60 dBm	13	+1
-65 dBm	14	+1
-70 dBm	14	0
-75 dBm	14	0
Not Applied	14	0
Comments on Test Results		

Test Number and Label		
OLR.2.1.3: Tone #3, Injected at 103.5 kHz (Bin 24)		
Purpose: The purpose of this test is to observe the basic bit swap functionality of the ATU-R/ATU-C pair by injecting an interfering tone at the system's 24th subcarrier frequency.		
Transmission System Parameters		
Parameter	**Value**	
Modulation	ADSL2	
Upstream Data Rate (kbps)	1202	
Downstream Data Rate (kbps)	11996	
Upstream Attainable Data Rate (kbps)	NA	
Downstream Attainable Data Rate (kbps)	NA	
Upstream SNRM (dB)	5.7	
Downstream SNRM (dB)	10.5	
Upstream Aggregate Transmit Power (dBm)	12.1	
Downstream Aggregate Transmit Power (dBm)	18.6	
Upstream Line Attenuation (dB)	10	
Downstream Line Attenuation (dB)	17	
Upstream Interleave Delay (sec)	12	
Downstream Interleave Delay (sec)	0	
Upstream INP (symbols)	NA	
Downstream INP (symbols)	NA	
Test Results		
Tone Level	**Bits in Bin #24**	**Bits Swapped**
Not Applied	15	-
-75 dBm	15	0
-70 dBm	14	-1
-65 dBm	14	0
-60 dBm	14	0
-55 dBm	12	-2
-50 dBm	11	-1
-55 dBm	12	+1
-60 dBm	13	+1
-65 dBm	13	0
-70 dBm	14	+1
-75 dBm	14	0
Not Applied	14	0
Comments on Test Results		

Test Number and Label		
OLR.2.1.4: Tone #4, Injected at 345 kHz (Bin 80)		
Purpose: The purpose of this test is to observe the basic bit swap functionality of the ATU-R/ATU-C pair by injecting an interfering tone at the system's 80th subcarrier frequency.		
Transmission System Parameters		
Parameter	**Value**	
Modulation	ADSL2	
Upstream Data Rate (kbps)	1232	
Downstream Data Rate (kbps)	11996	
Upstream Attainable Data Rate (kbps)	NA	
Downstream Attainable Data Rate (kbps)	NA	
Upstream SNRM (dB)	5.5	
Downstream SNRM (dB)	10.5	
Upstream Aggregate Transmit Power (dBm)	16.3	
Downstream Aggregate Transmit Power (dBm)	18.5	
Upstream Line Attenuation (dB)	NA	
Downstream Line Attenuation (dB)	NA	
Upstream Interleave Delay (sec)	0	
Downstream Interleave Delay (sec)	11	
Upstream INP (symbols)	NA	
Downstream INP (symbols)	NA	
Test Results		
Tone Level	**Bits in Bin #80**	**Bits Swapped**
Not Applied	15	-
-75 dBm	14	-1
-70 dBm	13	-1
-65 dBm	11	-2
-60 dBm	10	-1
-55 dBm	8	-2
-50 dBm	7	-1
-55 dBm	7	0
-60 dBm	9	+2
-65 dBm	11	+2
-70 dBm	12	+1
-75 dBm	13	+1
Not Applied	14	+1
Comments on Test Results		

Test Number and Label		
OLR.2.1.5: Tone #5, Injected at 690 kHz (Bin 160)		
Purpose: The purpose of this test is to observe the basic bit swap functionality of the ATU-R/ATU-C pair by injecting an interfering tone at the system's 160th subcarrier frequency.		
Transmission System Parameters		
Parameter	**Value**	
Modulation	ADSL2	
Upstream Data Rate (kbps)	1171	
Downstream Data Rate (kbps)	11996	
Upstream Attainable Data Rate (kbps)	NA	
Downstream Attainable Data Rate (kbps)	NA	
Upstream SNRM (dB)	5.9	
Downstream SNRM (dB)	11	
Upstream Aggregate Transmit Power (dBm)	12.3	
Downstream Aggregate Transmit Power (dBm)	18.6	
Upstream Line Attenuation (dB)	9.9	
Downstream Line Attenuation (dB)	16.5	
Upstream Interleave Delay (sec)	12	
Downstream Interleave Delay (sec)	0	
Upstream INP (symbols)	NA	
Downstream INP (symbols)	NA	
Test Results		
Tone Level	**Bits in Bin #160**	**Bits Swapped**
Not Applied	14	-
-75 dBm	13	-1
-70 dBm	11	-2
-65 dBm	10	-1
-60 dBm	8	-2
-55 dBm	7	-1
-50 dBm	5	-2
-55 dBm	6	+1
-60 dBm	7	+1
-65 dBm	9	+2
-70 dBm	10	+1
-75 dBm	12	+2
Not Applied	14	+2
Comments on Test Results		

Test Number and Label		
OLR.2.1.6: Tone #6, Injected at 966 kHz (Bin 224)		
Purpose: The purpose of this test is to observe the basic bit swap functionality of the ATU-R/ATU-C pair by injecting an interfering tone at the system's 224th subcarrier frequency.		
Transmission System Parameters		
Parameter	**Value**	
Modulation	ADSL2	
Upstream Data Rate (kbps)	1228	
Downstream Data Rate (kbps)	11996	
Upstream Attainable Data Rate (kbps)	NA	
Downstream Attainable Data Rate (kbps)	NA	
Upstream SNRM (dB)	2.5	
Downstream SNRM (dB)	11	
Upstream Aggregate Transmit Power (dBm)	16.2	
Downstream Aggregate Transmit Power (dBm)	18.6	
Upstream Line Attenuation (dB)	9.9	
Downstream Line Attenuation (dB)	17	
Upstream Interleave Delay (sec)	11	
Downstream Interleave Delay (sec)	0	
Upstream INP (symbols)	NA	
Downstream INP (symbols)	NA	
Test Results		
Tone Level	**Bits in Bin #224**	**Bits Swapped**
Not Applied	13	-
-75 dBm	11	-2
-70 dBm	10	-1
-65 dBm	9	-1
-60 dBm	7	-2
-55 dBm	5	-2
-50 dBm	4	-1
-55 dBm	4	0
-60 dBm	6	+2
-65 dBm	7	+1
-70 dBm	9	+2
-75 dBm	10	+1
Not Applied	13	+3
Comments on Test Results		

Test Number and Label
OLR.2.2.1, Tone #1, Injected at 51.75 kHz (Bin 12)
Purpose: The purpose of this test is to observe the functionality of bit swapping between an ATU-C/ATU-C pair in the presence of a stressful narrow bandwidth noise located at the system's 12th subcarrier frequency.

Transmission System Parameters

Transmission Parameters	**Value**
Modulation	ADSL2
Upstream Data Rate (kbps)	1159
Downstream Data Rate (kbps)	11637
Upstream Attainable Data Rate (kbps)	NA
Downstream Attainable Data Rate (kbps)	NA
Upstream SNRM (dB)	6.5
Downstream SNRM (dB)	13.9
Upstream Aggregate Transmit Power (dBm)	12.1
Downstream Aggregate Transmit Power (dBm)	16.4
Upstream Line Attenuation (dB)	9.9
Downstream Line Attenuation (dB)	0
Upstream Interleave Delay (sec)	12
Downstream Interleave Delay (sec)	10
Upstream INP (symbols)	NA
Downstream INP (symbols)	NA

Test Results

Time Elapsed	**Bits in Bin #12**	**Bits Swapped**	**Upstream CRC Errors**	**Downstream CRC Errors**
Prior to Application	13	-	0	0
30 sec	11	-2	0	0
60 sec	11	0	0	0
90 sec	11	0	0	0
120 sec	11	0	0	0
150 sec	11	0	0	0
180 sec	11	0	0	0
210 sec	11	0	0	0
240 sec	11	0	0	0
270 sec	11	0	0	0
300 sec	11	0	0	0

Comments on Test Results

Test Number and Label
OLR.2.2.2, Tone #2, Injected at 86.25 kHz (Bin 20)
Purpose: The purpose of this test is to observe the functionality of bit swapping between an ATU-C/ATU-C pair in the presence of a stressful narrow bandwidth noise located at the system's 20th subcarrier frequency.

Transmission System Parameters

Transmission Parameters	**Value**
Modulation	ADSL2
Upstream Data Rate (kbps)	1144
Downstream Data Rate (kbps)	11656
Upstream Attainable Data Rate (kbps)	NA
Downstream Attainable Data Rate (kbps)	NA
Upstream SNRM (dB)	5.9
Downstream SNRM (dB)	13.8
Upstream Aggregate Transmit Power (dBm)	12.1
Downstream Aggregate Transmit Power (dBm)	16.5
Upstream Line Attenuation (dB)	9.9
Downstream Line Attenuation (dB)	27.7
Upstream Interleave Delay (sec)	12
Downstream Interleave Delay (sec)	10
Upstream INP (symbols)	NA
Downstream INP (symbols)	NA

Test Results

Time Elapsed	**Bits in Bin #20**	**Bits Swapped**	**Upstream CRC Errors**	**Downstream CRC Errors**
Prior to Application	14	-	0	0
30 sec	12	-2	0	0
60 sec	12	0	0	0
90 sec	12	0	0	0
120 sec	12	0	0	0
150 sec	12	0	0	0
180 sec	12	0	0	0
210 sec	12	0	0	0
240 sec	12	0	0	0
270 sec	12	0	0	0
300 sec	12	0	0	0

Comments on Test Results

Test Number and Label	
OLR.2.2.3, Tone #3, Injected at 103.5 kHz (Bin 24)	
Purpose: The purpose of this test is to observe the functionality of bit swapping between an ATU-C/ATU-C pair in the presence of a stressful narrow bandwidth noise located at the system's 24th subcarrier frequency.	
Transmission System Parameters	
Transmission Parameters	**Value**
Modulation	ADSL2
Upstream Data Rate (kbps)	1182
Downstream Data Rate (kbps)	11749
Upstream Attainable Data Rate (kbps)	NA
Downstream Attainable Data Rate (kbps)	NA
Upstream SNRM (dB)	6
Downstream SNRM (dB)	14
Upstream Aggregate Transmit Power (dBm)	12.2
Downstream Aggregate Transmit Power (dBm)	16.4
Upstream Line Attenuation (dB)	9.9
Downstream Line Attenuation (dB)	27.7
Upstream Interleave Delay (sec)	12
Downstream Interleave Delay (sec)	0
Upstream INP (symbols)	NA
Downstream INP (symbols)	NA

Test Results

Time Elapsed	Bits in Bin #24	Bits Swapped	Upstream CRC Errors	Downstream CRC Errors
Prior to Application	14	-	0	0
30 sec	10	-4	0	0
60 sec	10	0	0	0
90 sec	10	0	0	0
120 sec	10	0	0	0
150 sec	10	0	0	0
180 sec	10	0	0	0
210 sec	10	0	0	0
240 sec	10	0	0	0
270 sec	10	0	0	0
300 sec	10	0	0	0

Comments on Test Results

Test Number and Label
OLR.2.2.4, Tone #4, Injected at 345 kHz (Bin 80)
Purpose: The purpose of this test is to observe the functionality of bit swapping between an ATU-C/ATU-C pair in the presence of a stressful narrow bandwidth noise located at the system's 80th subcarrier frequency.

Transmission System Parameters

Transmission Parameters	**Value**
Modulation	ADSL2
Upstream Data Rate (kbps)	1359
Downstream Data Rate (kbps)	11997
Upstream Attainable Data Rate (kbps)	NA
Downstream Attainable Data Rate (kbps)	NA
Upstream SNRM (dB)	7.3
Downstream SNRM (dB)	16.5
Upstream Aggregate Transmit Power (dBm)	12
Downstream Aggregate Transmit Power (dBm)	11.8
Upstream Line Attenuation (dB)	9.9
Downstream Line Attenuation (dB)	16
Upstream Interleave Delay (sec)	11
Downstream Interleave Delay (sec)	11
Upstream INP (symbols)	NA
Downstream INP (symbols)	NA

Test Results

Time Elapsed	**Bits in Bin #80**	**Bits Swapped**	**Upstream CRC Errors**	**Downstream CRC Errors**
Prior to Application	15	-	0	0
30 sec	11	-4	0	0
60 sec	7	-4	0	0
90 sec	8	+1	0	0
120 sec	6	-2	0	0
150 sec	6	0	0	0
180 sec	6	0	0	0
210 sec	6	0	0	0
240 sec	6	0	0	0
270 sec	6	0	0	0
300 sec	6	0	0	0

Comments on Test Results

Test Number and Label
OLR.2.2.5, Tone #5, Injected at 690 kHz (Bin 160)
Purpose: The purpose of this test is to observe the functionality of bit swapping between an ATU-C/ATU-C pair in the presence of a stressful narrow bandwidth noise located at the system's 160th subcarrier frequency.

Transmission System Parameters

Transmission Parameters	**Value**
Modulation	ADSL2
Upstream Data Rate (kbps)	1148
Downstream Data Rate (kbps)	11742
Upstream Attainable Data Rate (kbps)	NA
Downstream Attainable Data Rate (kbps)	NA
Upstream SNRM (dB)	6.2
Downstream SNRM (dB)	13.2
Upstream Aggregate Transmit Power (dBm)	12.1
Downstream Aggregate Transmit Power (dBm)	16.5
Upstream Line Attenuation (dB)	9.9
Downstream Line Attenuation (dB)	27.4
Upstream Interleave Delay (sec)	12
Downstream Interleave Delay (sec)	10
Upstream INP (symbols)	NA
Downstream INP (symbols)	NA

Test Results

Time Elapsed	**Bits in Bin #160**	**Bits Swapped**	**Upstream CRC Errors**	**Downstream CRC Errors**
Prior to Application	15	-	0	0
30 sec	11	-4	0	0
60 sec	6	-5	0	0
90 sec	2	-4	0	0
120 sec	6	+4	0	0
150 sec	6	0	0	0
180 sec	6	0	0	0
210 sec	6	0	0	0
240 sec	6	0	0	0
270 sec	6	0	0	0
300 sec	6	0	0	0

Comments on Test Results

Test Number and Label	
OLR.2.2.6, Tone #6, Injected at 966 kHz (Bin 224)	
Purpose: The purpose of this test is to observe the functionality of bit swapping between an ATU-C/ATU-C pair in the presence of a stressful narrow bandwidth noise located at the system's 224th subcarrier frequency.	
Transmission System Parameters	
Transmission Parameters	**Value**
Modulation	ADSL2
Upstream Data Rate (kbps)	1167
Downstream Data Rate (kbps)	11768
Upstream Attainable Data Rate (kbps)	NA
Downstream Attainable Data Rate (kbps)	NA
Upstream SNRM (dB)	6.4
Downstream SNRM (dB)	13.2
Upstream Aggregate Transmit Power (dBm)	12.2
Downstream Aggregate Transmit Power (dBm)	16.4
Upstream Line Attenuation (dB)	9.9
Downstream Line Attenuation (dB)	27.6
Upstream Interleave Delay (sec)	NA
Downstream Interleave Delay (sec)	NA
Upstream INP (symbols)	NA
Downstream INP (symbols)	NA

Test Results

Time Elapsed	Bits in Bin #224	Bits Swapped	Upstream CRC Errors	Downstream CRC Errors
Prior to Application	15	-	0	0
30 sec	11	-4	0	0
60 sec	7	-4	0	0
90 sec	5	-2	0	0
120 sec	5	0	0	0
150 sec	5	0	0	0
180 sec	5	0	0	0
210 sec	5	0	0	0
240 sec	5	0	0	0
270 sec	5	0	0	0
300 sec	5	0	0	0

Comments on Test Results

Appendix A: Profile Parameters

Profile Used in Group 1 Tests		Profile Used in Group 2 Tests	
Channel Configuration Parameters	**Value**	**Channel Configuration Parameters**	**Value**
Upstream Minimum Data Rate (kbps)	32	Upstream Minimum Data Rate (kbps)	32
Upstream Maximum Data Rate (kbps)	1600	Upstream Maximum Data Rate (kbps)	1600
Downstream Minimum Data Rate (kbps)	32	Downstream Minimum Data Rate (kbps)	32
Downstream Maximum Data Rate (kbps)	24000	Downstream Maximum Data Rate (kbps)	32000
Upstream Maximum Interleave Delay (ms)	16	Upstream Maximum Interleave Delay (ms)	16
Downstream Maximum Interleave Delay (ms)	16	Downstream Maximum Interleave Delay (ms)	16
Upstream Impulse Noise Protection (symbols)	0	Upstream Impulse Noise Protection (symbols)	0
Downstream Impulse Noise Protection (symbols)	0	Downstream Impulse Noise Protection (symbols)	0
Line Configuration Parameters	**Value**	**Line Configuration Parameters**	**Value**
Modulation	ADSL2+	Modulation	ADSL2
Rate Adaptation Mode	Adapt at Runtime	Rate Adaptation Mode	Adapt at Startup
Upstream Maximum Noise Margin (dB)	31	Upstream Maximum Noise Margin (dB)	31
Upstream Upshift Noise Margin (dB)	8	Upstream Upshift Noise Margin (dB)	8
Upstream Target Noise Margin (dB)	6	Upstream Target Noise Margin (dB)	6
Upstream Downshift Noise Margin (dB)	4	Upstream Downshift Noise Margin (dB)	4
Upstream Minimum Noise Margin (dB)	0	Upstream Minimum Noise Margin (dB)	0
Upstream Upshift Time Interval (sec)	30	Upstream Upshift Time Interval (sec)	30
Upstream Downshift Time Interval (sec)	30	Upstream Downshift Time Interval (sec)	30
Upstream Maximum Power (dBm)	13	Upstream Maximum Power (dBm)	13
Downstream Maximum Noise Margin (dB)	31	Downstream Maximum Noise Margin (dB)	31
Downstream Upshift Noise Margin (dB)	8	Downstream Upshift Noise Margin (dB)	8
Downstream Target Noise Margin (dB)	6	Downstream Target Noise Margin (dB)	6
Downstream Downshift Noise Margin (dB)	4	Downstream Downshift Noise Margin (dB)	4
Downstream Minimum Noise Margin (dB)	0	Downstream Minimum Noise Margin (dB)	0
Downstream Upshift Time Interval (sec)	30	Downstream Upshift Time Interval (sec)	30
Downstream Downshift Time Interval (sec)	30	Downstream Downshift Time Interval (sec)	30
Downstream Maximum Power (dBm)	20	Downstream Maximum Power (dBm)	20
Miscellaneous Parameters	**Value**	**Miscellaneous Parameters**	**Value**
Trellis Coding	Enabled	Trellis Coding	Enabled
Bit Swapping	Enabled	Bit Swapping	Enabled